Electronic Supplementary Material (ESI) for Dalton Transactions

Study of interface properties in CuPc based hybrid inorganic-organic solar cells

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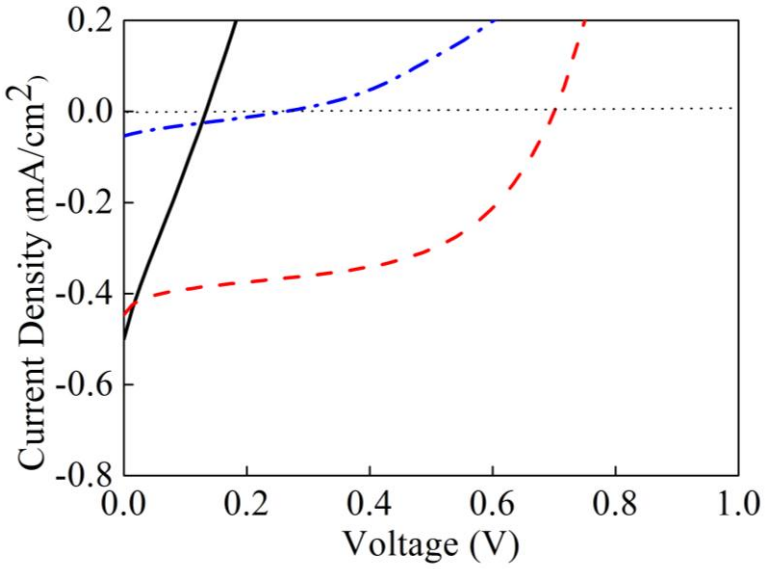

Fig. S1. I-V measurements of TiO_2:**C101** (—), TiO_2:**CuPc** (-·-) and TiO_2:**C101**:**CuPc** (--) devices measured under standard AM 1.5 illumination.

A SEM topographical view of the deposited CuPc film is given in Fig S2. There it can be observed that, the formed film was homogeneous with small crystal grains with an average diameter of 100 - 160 nm. This value is in good agreement with the literature results.[1, 2] Moreover charge carrier mobility is higher in crystalline materials than in amorphous materials.[2] The CuPc crystal grains are greater than the average pore size of the TiO_2 layer limiting the infiltration of CuPc into mesoporous layer.

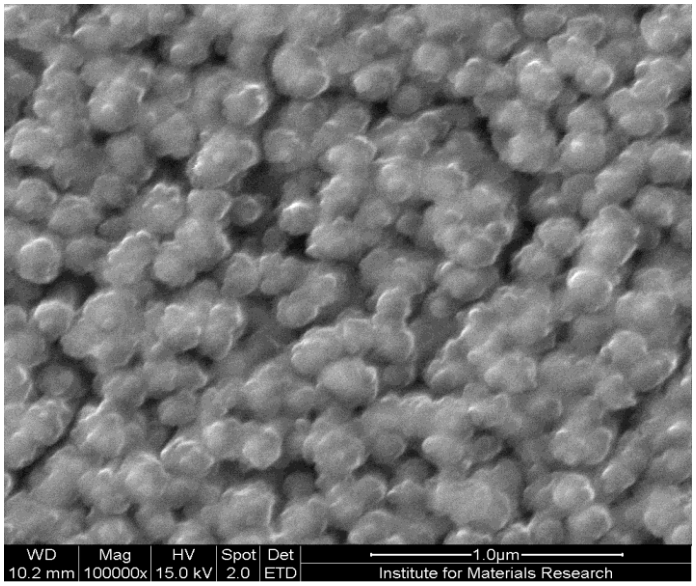

Fig S2: Topographical view of deposited CuPc film by SEM.

The CuPc only device was prepared according to the literature.[3] From dark I-V measurements with the help of SCLC eqn (s1), a hole mobility of 2 x 10^{-4} cm^2/Vs was attained and the fitting is shown in Fig S3, where ε_0, ε_r are the dielectric permittivity of free space and polymer material (3.6[4]) respectively, μ is the mobility, V_{bi} is the built-in voltage (1V) and d is the film thickness (120 nm).

$$J = \frac{9}{8}\varepsilon_0\varepsilon_r\mu\frac{(V - V_{bi})^2}{d^3} \qquad \text{Eq S1}$$

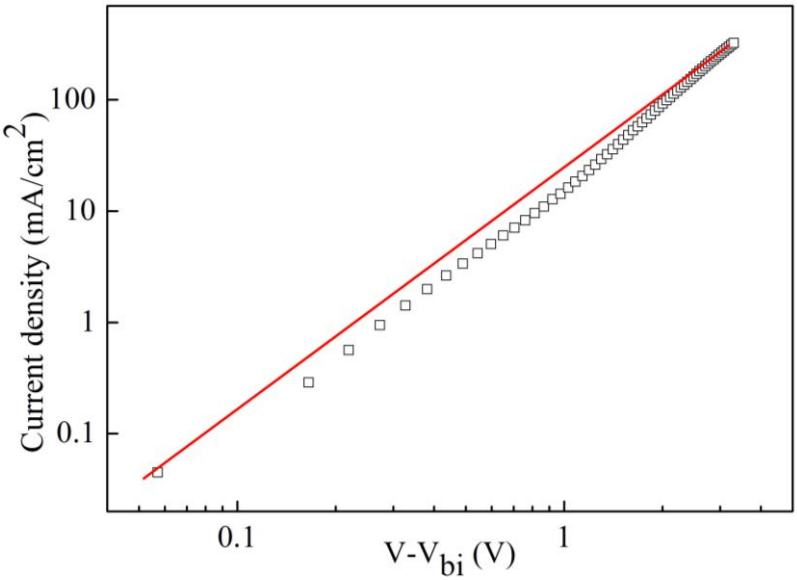

Fig S3: The log – log plot of current density (J) – voltage ($V-V_{bi}$) of CuPc only device. Solid lines represent the linear fit used for obtaining the hole mobility of CuPc.

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